REMARKS

This is a full and timely response to the Office Action mailed October 31, 2003 (Paper No. 11). Reexamination and reconsideration in light of the foregoing amendments and following remarks is respectfully solicited.

Claims 5, 7-10, and 12-14 are now pending in the application, with Claims 5 and 10 being the independent claims. Claims 5, 7, and 12 have been amended to correct minor cosmetic, grammatical, or typographical errors. No new matter is believed to have been added.

I. Claim Objections

Per the Examiner's suggestion, Claim 5 has been amended to replace "experiences" with "experience". Accordingly, the Applicant requests withdrawal of the Examiner's objection to Claim 5.

II. Rejections Under 35 U.S.C. 102(b)

Claims 5, 7, 10, and 12 were rejected under 35 U.S.C. § 102 (b) as allegedly being anticipated by U.S. Patent No. 6,315,094 (Griffin et al). This rejection is respectfully traversed, at least in light of the above amendments.

Independent Claim 5 relates to a tuned mass damper that includes a mass having predetermined inertia properties, and a plurality of isolators arranged in a hexapod configuration that are coupled to the mass and adapted to couple to a structure that may experience vibrations in six degrees of freedom, and recites, *inter alia*, wherein each of the isolators, in combination with the mass, is individually tuned to reduce the vibrations experienced by the structure.

Independent Claim 10 relates to a system that includes a structure that experiences vibrations in six degrees of freedom and a tuned mass damper. The tuned mass damper includes a mass having predetermined inertia properties, and a plurality of isolators arranged in a hexapod configuration that are coupled to the mass and adapted to couple to the structure that may experience vibrations in six degrees of freedom. Independent Claim 10 also recites, *inter alia*, wherein each of the isolators, in combination with the mass, is individually tuned to reduce the vibrations experienced by the structure.

Griffin et al. relates to a virtual sky hook vibration isolation system that combines a

primary mass suspended by a primary suspension and a secondary mass coupled to the primary mass. The sky hook system provides reduction of transmissibility at resonance without significantly increasing high frequency transmissibility and achieves isolation passively. Griffin et al. further discloses the use of a hexapod type suspension for the secondary mass.

However, contrary to the Examiner's allegations, Griffin et al. does not disclose at least the above noted features of independent Claims 5 and 10. Namely, Griffin et al. fails to disclose or suggest **tuning** each individual isolator of a tuned mass damper in all six independent degrees of freedom such that each of the isolators, in combination with the mass, is individually tuned to reduce the vibrations experienced by the structure, as recited in independent Claims 5 and 10. As stated on page 4 of the Applicant's application, "The application and result...in this arrangement...[have] the predictable or deterministic mechanics of the hexapod, each strut 14 can be tuned with the one mass 10 to reduce particular frequencies alone or in combination with one or more other struts 14...Consequently, the attenuation for each strut can be calculated, thus making it possible to finely tune each strut by adjusting its respective spring 15 constant and location for a particular structure (damped mass 12). The one mass 10 and each strut 14 is a directional TMD, in effect, and vibrations in all six degrees of freedom, possibly differing in frequency, of damped mass 12 can be damped with a single TMD mass with predetermined inertia properties." This novel feature, achieved by the capability of tuning each isolator individually or in combination, with the mass, is not achieved by the sky hook system disclosed in Griffin et al.

In fact, Griffin et al. appears to teach against tunability in all six independent degrees of freedom. Specifically, referring to FIG. 9 of Griffin et al., the hexapod-type suspension coupled to the secondary mass shown in the figure illustrates struts that have built ends that, if used on a tuned mass damper, would degrade tunability in all six degrees of freedom, not enhance tunability.

Thus, in view of the above, Applicants respectfully solicit reconsideration and withdrawal of the § 102(b) rejection.

III. Rejections Under 35 U.S.C. § 103

A. Claims 8 and 13

Claims 8 and 13 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Griffin et al. in view of Cunningham et al. Claims 8 and 13 depend from and incorporate the features of independent Claims 5 and 10, respectively and each further recites that the isolator is individually tuned by adjusting its spring constant and the predetermined location on the structure to which it couples.

The Examiner acknowledges that Griffin et al. does not teach wherein each isolator comprises a spring having an adjustable spring constant, and wherein each isolator is individually tuned by adjusting its spring constant and the predetermined location on the structure to which its second end will couple, but alleges that Cunningham et al. makes up for the deficiencies. The Applicants disagree with the Examiner's assessment.

Cunningham et al. relates to a system for isolating a supported structure from transmitting vibrations to a supporting base in a spacecraft that provides six degrees of freedom in a kinematic mounting. However, nothing in Cunningham et al. discloses or teaches individually tuning an isolator by adjusting its spring constant and the predetermined location on the structure to which the isolator couples. Additionally, nowhere does Cunningham et al. or Griffin et al. disclose a tuned mass damper. Moreover, the Examiner does not point to or cite to any portion of Cunningham et al. that allegedly contains these deficient features. Therefore, reconsideration and withdrawal of the § 103 rejection is, therefore, respectfully requested.

B. Claim 9 and 14

Claims 9 and 14 were rejected under 35 U.S.C. 103 (a) as allegedly being unpatentable over Griffin et al. in view of Gran et al. Claims 9 and 14 also depend from and incorporate the features of independent Claims 5 and 10 and each further comprises a tubular damping strut that is coupled between the isolator first and second ends and first and second spherical pivots that are coupled to each of the isolator ends.

The Examiner alleges that Gran et al. makes up for the deficiencies of Griffin et al., namely wh rein isolators comprise tubular damping struts with first and second spherical pivots

at opposite ends of the tubular damping strut.

Gran et al. discloses a vibration isolation and precision pointing device for reducing vibrational disturbances on a payload platform which is subject to vibration transmitted from a base platform and to other possible vibrational disturbances applied directly to the payload itself or to the payload platform. However, Gran et al. does not disclose a tuned mass damper, as recited in both claims 9 and 14, nor does Gran et al. remotely disclose or suggest at least that each of the isolators, in combination with the mass, is individually tuned to reduce the vibrations experienced by the structure, as recited in independent Claims 5 and 10.

In view of the foregoing, reconsideration and withdrawal of each of the § 103 rejections is respectfully requested.

IV. Conclusion

Based on the above, the claims are patentable over the citations of record. The dependent claims are also submitted to be patentable for the reasons given above with respect to the independent claims and because each recite features which are patentable in its own right. Individual consideration of the dependent claims is respectfully solicited.

The other art of record is also not understood to disclose or suggest the inventive concept of the present invention as defined by the claims.

Hence, Applicant submits that the present application is in condition for allowance. Favorable reconsideration and withdrawal of the objections and rejections set forth in the above-noted Office Action, and an early Notice of Allowance are requested.

If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the below-listed number.

If for some reason Applicant has not paid a sufficient fee for this response, please consider this as authorization to charge Ingrassia, Fisher & Lorenz, Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

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